

Third Five-Year Review Report

Outboard Marine Corporation Superfund Site Waukegan, Illinois

Prepared by U.S. EPA, Region 5, Chicago, Illinois

EPA Region 5 Records Ctr.

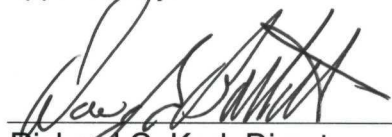


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Approved by:

Date:

for 
Richard C. Karl, Director
Superfund Division
U.S. Environmental Protection Agency

7/26/07

Photo credit: City of Waukegan, courtesy of John Moore, Engineering Department.

This February 2006 aerial photo shows the entire Outboard Marine Corporation (OMC) Superfund site in Waukegan, Illinois. North is at the top of the frame. The OMC site includes the (northern) Waukegan Harbor site, the OMC Plant 2 (or "North Plant") site (the large building at the top of the photo), and the Waukegan Manufactured Gas and Coke Plant site (cleared area in center of frame). Lake Michigan can be seen to the east of the sand dune and beach areas. (See also Figure 2 on page 5 of the report.)

Five-Year Review Report

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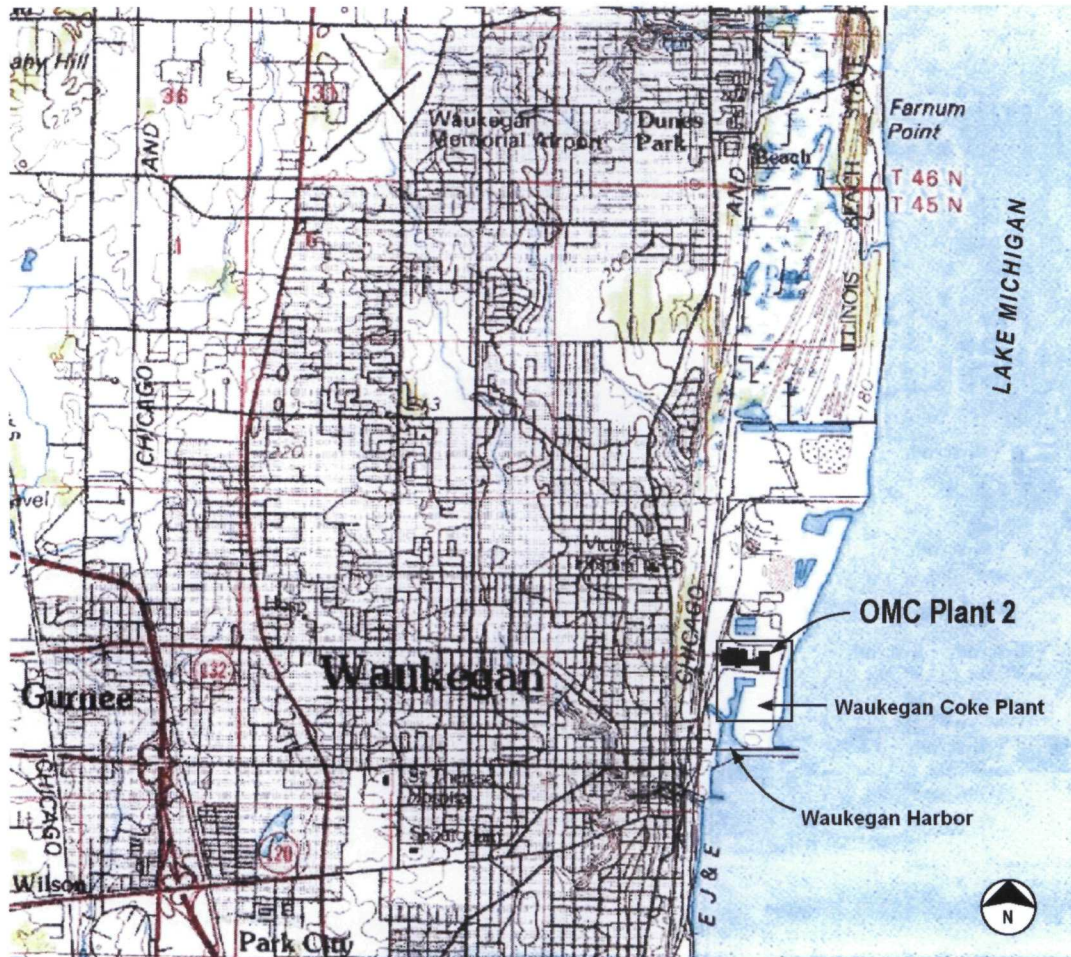
List of Acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
FDA	Food and Drug Administration
IDNR	Illinois Department of Natural Resources
IDPH	Illinois Department of Public Health
Illinois EPA	Illinois Environmental Protection Agency
mg/kg	Milligrams per kilogram ("parts per million")
mg/L	Milligrams per liter ("parts per million")
MNA	Monitored natural attenuation
NCP	National (Oil and Hazardous Substances Pollution) Contingency Plan
NPL	National Priorities List
O&M	Operation and maintenance
OMC	Outboard Marine Corporation
OU	Operable unit
PAHs	Polynuclear aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
PPM	Parts per million
PRP	Potentially responsible party
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation and Feasibility Study
SWAC	Surface weighted average concentration
TCE	Trichloroethene
µg/L	Micrograms per liter ("parts per billion")
VOCs	Volatile organic compounds
WCP	Waukegan (Manufactured Gas and) Coke Plant
U.S. EPA	United States Environmental Protection Agency

Executive Summary

Introduction

The Outboard Marine Corporation (OMC) National Priorities List (NPL) site is located in Waukegan, Illinois, about 40 miles north of Chicago (see map – lower right).



Source: USGS Waukegan Quadrangle Map

The United States Environmental Protection Agency (U.S. EPA) has divided the OMC site into four operable units (OU):

- OU #1:** Waukegan Harbor site
- OU #2:** Waukegan Manufactured Gas and Coke Plant site
- OU #3:** PCB Containment Cells
- OU #4:** OMC Plant 2 site

Outboard Marine Corporation completed a cleanup action under U.S. EPA oversight at the Waukegan Harbor site from 1990-1993. In accordance with U.S. EPA's 1984

Record of Decision (ROD) and 1989 ROD Amendment, OMC dredged the northern harbor area to remove sediment contaminated with polychlorinated biphenyls (PCBs) and excavated some PCB-laden soils around its OMC Plant 2 facility to achieve a 50 milligrams per kilogram (mg/kg) (parts per million (ppm)) PCB cleanup level. Outboard Marine Corporation treated some of the more highly contaminated dredged spoils to remove PCB oil for off-site destruction and constructed three containment cells on its property to hold both treated and untreated sediment and soil containing PCBs above 50 ppm. Afterwards, OMC began the long term operation and maintenance (O&M) of the PCB Containment Cells.

During the course of cleaning up the harbor sediment OMC discovered soil contaminants on an adjacent property it owned that soon became the Waukegan Manufactured Gas and Coke Plant ("Waukegan Coke Plant" (WCP)) site. One of the other potentially responsible parties (PRPs) for the WCP site conducted a remedial investigation and feasibility study (RI/FS) at the WCP site from 1992 to 1999. U.S. EPA then signed a ROD in September 1999 selecting soil and groundwater cleanup actions for the site. Two of the WCP site PRPs completed the soils clean up work at the site in November 2005 under U.S. EPA oversight and began construction of the groundwater pump-and-treat system in April 2007 with an estimated completion date of June 2008. Active treatment of groundwater will occur for an estimated three to eight years before converting to monitored natural attenuation (MNA) to address residual groundwater contaminants.

Outboard Marine Corporation declared bankruptcy in December 2000, and began liquidation proceedings in August 2001. Outboard Marine Corporation's 1,000,000 square-foot "Plant 2" (also known as the "North Plant") building and surrounding property went unsold and in summer 2002, U.S. EPA and the Estate of OMC reached agreement on terms under which the Estate could abandon the building and property. The terms mainly involved the Estate addressing certain imminent environmental threats posed by contaminants inside the building prior to abandonment. The Estate abandoned the building and property in December 2002. Meanwhile, because OMC held an interim federal Resource Conservation and Recovery Act (RCRA) permit to store hazardous materials used in the course of doing business, U.S. EPA's RCRA program inspected the OMC Plant 2 facility in 2001 and found numerous hazardous constituents in and around the building. Due to the bankruptcy proceedings and because the OMC Superfund site already existed, our RCRA program elected to defer the OMC Plant 2 site to the Superfund program in 2005. The OMC Plant 2 site by then had become OU #4.

The U.S. EPA Superfund program conducted several removal actions at the OMC Plant 2 site from 2001-2003 to stabilize or remove hazardous wastes from the building and also began an RI/FS at the site in 2004. In December 2006, U.S. EPA released a proposed plan for cleanup of the abandoned building and surrounding soil and sediment impacted by PCBs. The U.S. EPA signed a ROD for the OMC Plant 2 site in September 2007 that selected the cleanup methods for the abandoned building and surrounding soil and sediment. The U.S. EPA also began two pilot-scale, *in situ*

groundwater cleanup tests in late 2006, to help us determine a viable cleanup action for trichloroethene (TCE) in site groundwater. Once the testing is completed U.S. EPA will issue another proposed plan for public comment in the summer of 2008 before selecting a groundwater cleanup remedy for the site. The U.S. EPA also began part of the design of the selected building and soil remedies in July 2007.

The city of Waukegan purchased the WCP site in July 2002, from the OMC bankruptcy trustee and obtained title to the abandoned OMC Plant 2 property in 2005. The city made these transactions as an overall part of its strategy to redevelop its lakefront area into a mixed-use residential area with a maritime emphasis around Waukegan Harbor. This could complicate the cleanup processes planned for or in progress at the different operable units. For example, the 1984 cleanup remedy for Waukegan Harbor allowed for a 50 ppm PCB cleanup level and for placement of PCB Containment Cells on the OMC Plant 2 property, assuming that future use of the site would be commercial or industrial. With OMC out of business, this future-use assumption may no longer be valid. The WCP site soils cleanup action also achieved commercial/industrial cleanup levels in accordance with the 1999 ROD. However, as discussed above, the city intends to place a mixed-use, residential development on the site.

In this Five-Year Review, U.S. EPA, in consultation with Illinois EPA (IEPA), has determined that the Waukegan Harbor site (OU #1) currently is not protective because PCB levels in certain fish caught in Waukegan Harbor are too high based upon human consumption; the WCP site (OU #2) currently is protective because the soils cleanup work is completed and the groundwater work is getting underway and no one is using or drinking groundwater from beneath the site; the PCB Containment Cells site (OU #3) is currently protective because the city of Waukegan is effectively operating and maintaining the containment cells; and the OMC Plant 2 site (OU #4) currently is not protective because site cleanup work has not yet begun.

The U.S. EPA is making several recommendations in this Five-Year Review to bring the OMC site into protective status. These include: complete an investigation for OU #1 to determine a protective PCB cleanup level for the harbor sediment and then choose and implement a cleanup remedy to achieve the protective level; continue the OU #2 cleanup progress; continue to operate and maintain OU #3; and select and implement cleanup remedies for OU #4. The U.S. EPA also recommends that institutional controls be considered or placed on parts of the OMC site to ensure that future owners or residents are aware of residual environmental contaminants at the site and that they take no actions to either consume polluted groundwater or jeopardize the engineering controls either in place or to be placed at the site.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name: Outboard Marine Corporation (OMC)		
EPA ID: ILD 000802827		
Region: 5	State: Illinois	City/County: Waukegan/Lake County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input checked="" type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Construction completion date: N/A
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NOT YET [Note: City of Waukegan and others have tentative re-use plans pending.]		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> U.S. EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
Author name: Kevin Adler		
Author title: Remedial Project Manager		Affiliation: EPA – Superfund Division
Review period: 10 /17 /2006 to 09 /26 /2007		
Date(s) of site inspection: Various dates October 2002-September 2007		
Type of review: <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <div style="margin-left: 40px;"> <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion </div>		
Review number: <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input checked="" type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Actual RA Onsite Construction <input type="checkbox"/> Construction Completion <input type="checkbox"/> Other (specify) </div> <div> <input type="checkbox"/> Actual RA Start <input checked="" type="checkbox"/> Previous Five-Year Review Report </div> </div>		
Triggering action date: Sept. 26, 2002 (Signature date on Second 5-Yr Review)		
Due date: September 26, 2007		

Five-Year Review Summary Form (continued)

Issues:

Waukegan Harbor - The sediment PCB cleanup levels are not protective of human health and the environment. Certain species of harbor-caught fish are contaminated with unsafe levels of PCBs.

Waukegan Coke Plant - The groundwater remedy has not yet started. Implementation of all required institutional controls (ICs) has not yet been completed.

PCB Containment Cells - The cells may require ICs to be implemented for long-term protectiveness.

OMC Plant 2 - The site has identifiable risks to human health and the environment (cleanup is needed).

Recommendations and Follow-up Actions:

Waukegan Harbor – Complete a supplemental remedy selection process and conduct any selected cleanup actions. Maintain the fish-consumption advisory for the harbor area (state of Illinois).

Waukegan Coke Plant – Complete the construction of the groundwater remedy and begin operating it. Complete the placement of ICs on the property. Produce an ICs Plan by 2010 to address all land and groundwater use restrictions for the site.

PCB Containment Cells – Make a final ICs determination as a part of the OMC site-wide remedy selection processes and produce a IC Plan by 2010 to address potential land-use restrictions for the cells.

OMC Plant 2 – Complete remedy selection processes and perform the selected cleanup actions. Consider the use of ICs if cleanups are not to unrestricted use or unlimited exposure levels.

Protectiveness Statement(s):

The U.S. EPA has determined that the Waukegan Harbor site remedial action currently is not protective of human health and the environment because the 50 ppm PCB cleanup level selected in the 1984 ROD (as amended in the 1989 ROD Amendment) for the harbor sediment is too high. The U.S. EPA is planning to issue for public comment a Proposed Plan (for ROD Amendment) in which we may recommend a lower PCB cleanup level for the harbor sediments and a protective cleanup remedy to achieve the recommended PCB cleanup level. In the interim, a fish-consumption advisory is in place for the northern harbor area.

The U.S. EPA has determined that the remedy at the Waukegan Coke Plant site is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Long-term protectiveness will require compliance with ICs.

The U.S. EPA has determined that the PCB Containment Cells site currently is protective of human health and the environment because the cleanup is complete and the remedy is operating as designed. We will determine whether long term protectiveness will require implementation of and compliance with land-use restrictions that would prohibit interference with the containment cells.

The U.S. EPA has determined that the OMC Plant 2 site currently is not protective of human health and the environment because there are multiple contaminants in and around OMC Plant 2 that may cause actual or potential exposure to hazardous substances or pollutants.

Five-Year Review Summary Form (continued)

Date of last Regional review of Human Exposure Indicator (from WasteLAN): 10/16/2006

Human Exposure Survey Status (from WasteLAN): Current Human Exposure not controlled, some exposure control achieved.

Date of last Regional review of Groundwater Migration Indicator (from WasteLAN): 03/15/2007

Groundwater Migration Survey Status (from WasteLAN): Contaminated groundwater migration not under control.

Ready for Reuse Determination Status (from WasteLAN): (Not available)

Third Five-Year Review Report

I. Introduction

The United States Environmental Protection Agency (U.S. EPA) Region 5, in consultation with the Illinois Environmental Protection Agency (Illinois EPA), has conducted the third Five-Year Review for the Outboard Marine Corporation (OMC) Superfund site, Waukegan, Illinois. The U.S. EPA conducted this review from October 2006 through September 2007, covering all four operable units (OU) at the site. This report documents the results of our third Five-Year Review at the OMC site.

Purpose

The U.S. EPA conducts a Five-Year Review to determine whether a cleanup remedy at a site is, or is expected to be, protective of human health and the environment. The U.S. EPA documents the review methods, findings, and conclusions in Five-Year Review reports.

Authority

The U.S. EPA prepared this Five-Year Review report pursuant to CERCLA § 121 and the National Contingency Plan (NCP). CERCLA § 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The U.S. EPA interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR § 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

Triggering Action

A Five-Year Review is applicable to the OMC site because hazardous substances, pollutants, or contaminants at the site remain on site above levels that allow for unlimited use and unrestricted exposure. Hazardous substances, pollutants, or contaminants were left on site after an initial remedial action was completed in 1993, in Waukegan Harbor and will likely be left on site after construction of subsequent cleanup actions are completed in July 2008 and at later dates on other parts of the site.

The triggering action for this statutory review is the date of the second Five-Year Review for the OMC site as shown in U.S. EPA's CERCLIS database: September 26, 2002. The U.S. EPA shall undertake future Five-Year Reviews at the OMC site using previous trigger dates as long as hazardous substances, pollutants, or contaminants remain on site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1 summarizes the site chronology to date:

Table 1: Chronology of OMC Site Events

Event	Date
Initial discovery of contamination	c. 1976
Pre-NPL responses	c. 1976
NPL listing	September 1983 (Interim NPL: Oct. 1981)
Remedial Investigation/Feasibility Study complete	April 1984, March 1989 (OU #1) September 1999 (OU #2) December 2006 and March 2008** (OU #4)
ROD signature	April 1984 (OU #1) September 1999 (OU #2) Sept. 2007 and Sept. 2008** (OU #4)
ROD Amendment	March 1989 (OU #1)
Explanation of Significant Differences	September 2004 (OU #2) – for site re-use March 2008** (OU #3) – for site re-use
Consent Decrees	April 1989 (OUs #1 and #3) October 2004 (OU #2) September 2005 (OU #4)

Event	Date
Remedial design starts	April 1989 (OUs #1 and #3) July 2002 (OU #2) June 2007 (OU #4)
Remedial designs complete	October 1990 (OUs #1 and #3) March 2006 (OU #2) December 2007** (OU #4)
Actual remedial action starts	October 1990 (OUs #1 and #3) November 2004 (OU #2) Additional events planned (for OU #4)
Construction dates (start, finish)	October 1990-Sept. 1993 (OUs #1 and #3) November 2004 – July 2008** (OU #2) Additional events planned (for OU #4)
First Five-Year Review	September 30, 1997
Second Five-Year Review	September 26, 2002
Site Inspection date(s) - Third review	Various during 2006-2007
Construction completion date	Estimated 2012 (Site-wide)
Final Close-out Report	Estimated 2012 (Site-wide)
Deletion from NPL	Estimated 2028

Note: ** = Projected date

III. Background

Site Characteristics

The OMC site is located on Seahorse Drive a few blocks east of the intersection of Grand Avenue and Sheridan Road on the west shore of Lake Michigan in Waukegan, Illinois; about 40 miles north of Chicago and 10 miles south of the Illinois/Wisconsin border (see cover photograph and Figure 1 on the following page). The U.S. EPA has divided the site into four operable units (see Figure 2):

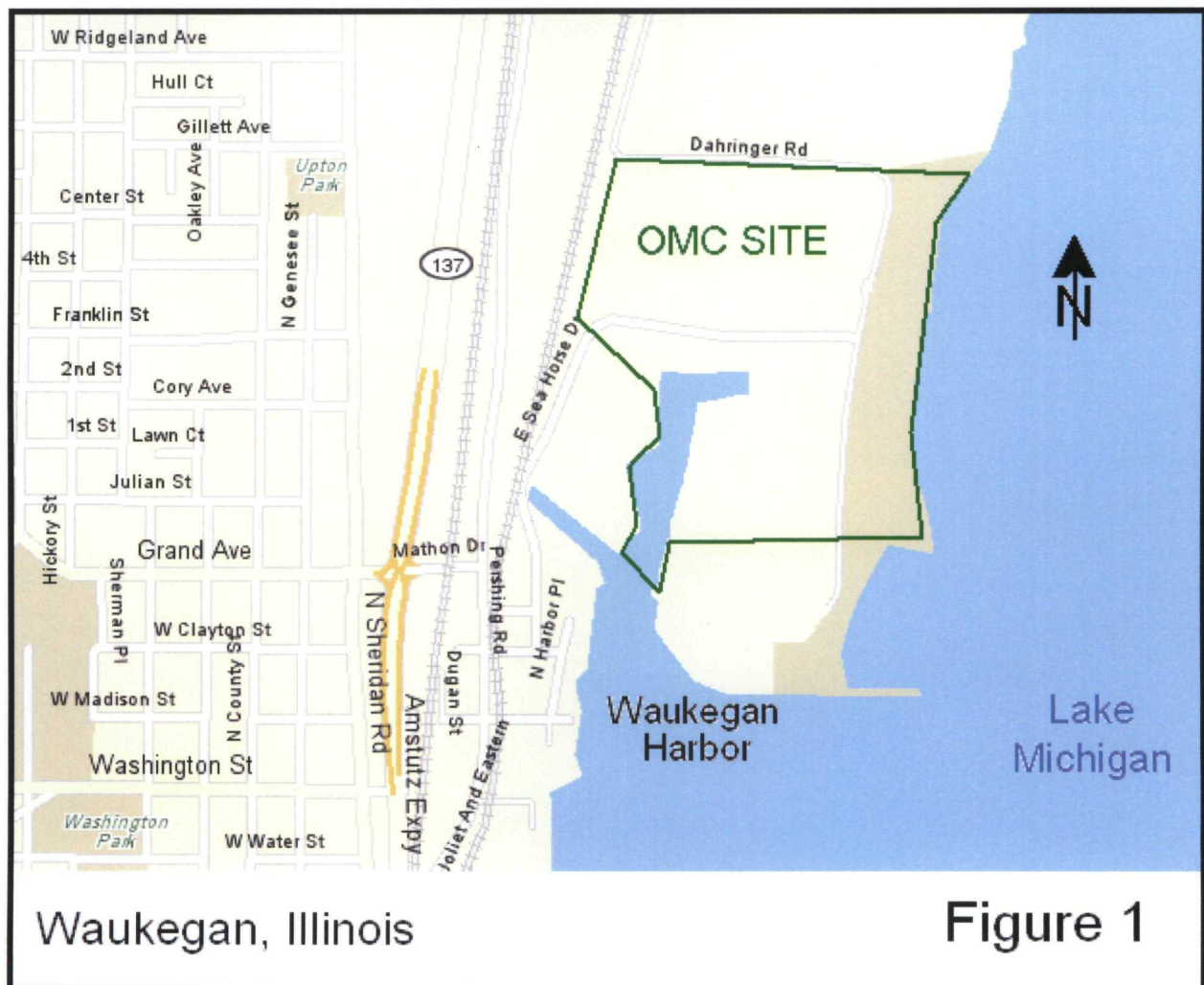
OU #1: Waukegan Harbor

OU #2: Waukegan Manufactured Gas and Coke Plant (Waukegan Coke Plant)

OU #3: PCB Containment Cells

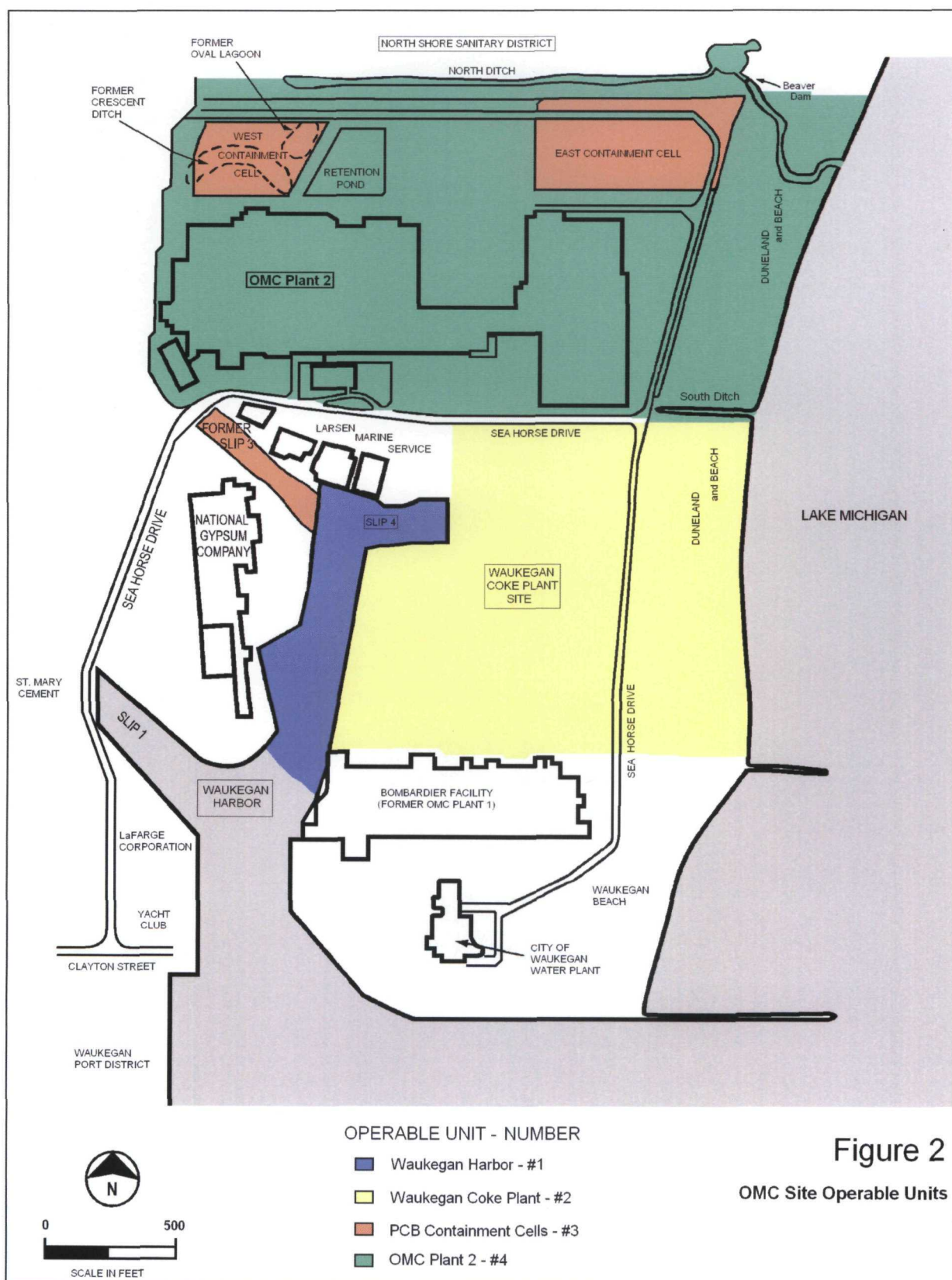
OU #4: OMC Plant 2

The OMC site is located within an area of industrial facilities and a marina that are situated around Waukegan Harbor. It is also next to the city beach. Thus, while not situated next to densely populated residential areas, a fair number of people frequent the harbor area to work, fish in the harbor, use the beach, or sail in the harbor and marina. Some of the beachfront areas on the site include ecologically-important emergent duneland environments with protected plant species growing on them.



OU #1: Waukegan Harbor

Waukegan Harbor is irregularly shaped and is about 37 acres in area. Water depths in the harbor generally vary from 14 to 20 feet. Harbor sediment consists of 1 to 7 feet of very soft organic silt (muck) overlying an average of 4 feet of medium dense, fine- to coarse-grained sand. Glacial till or "lake clay" underlies the sand and typically ranges from 50 to more than 100 feet thick. The harbor side walls are shored up with 20- to 25-foot steel sheet piling, except at the Waukegan Port District boat launching areas and at the retaining wall near the harbor mouth.



The areas of concern within the harbor were former Boat Slip #3 and the upper harbor area (north of Boat Slip #1), where large quantities of polychlorinated biphenyls (PCBs) were deposited in the sediment after OMC discharged PCBs and other fluids from its manufacturing facility (OMC Plant 2) during the 1960s and 1970s. Sediment PCB concentrations in former Boat Slip #3 were greater than 500 milligrams per kilogram (mg/kg or "parts per million" (ppm)) and PCB concentrations were between 50 and 500 ppm in the upper harbor.

The North Ditch is a small tributary to Lake Michigan that drains surface runoff from OMC, the North Shore Sanitary District, and other upland areas west of the OMC property and the adjacent railroad tracks. The drainage system formerly included the Crescent Ditch and the Oval Lagoon as well. However, PCB contamination in the Crescent Ditch and Oval Lagoon ranged from 50 to over 10,000 ppm. OMC removed hot-spot contamination (over 10,000 ppm) in the Crescent Ditch and Oval Lagoon during the Waukegan Harbor cleanup action (see Initial Response Actions section, below). These features now no longer exist as the West Containment Cell was constructed over them (Figure 2). A 9-acre parking lot area, located between the West and East containment cells north of the OMC Plant 2 facility, was contaminated with high levels of PCBs (between 50 and 5,000 ppm) and was also cleaned up by OMC during the 1990-1993 harbor cleanup action.

OU #2: Waukegan Coke Plant

The Waukegan Coke Plant (WCP) property is about 36 acres in area and lies between the former OMC Plant 1 and OMC Plant 2 facilities. The site was the location of a railroad tie-treatment plant in the early 1900s and then a manufactured gas and coke plant facility. OMC purchased the property in the 1970s and razed the coke plant buildings. The WCP site was discovered during the cleanup of Waukegan Harbor in 1990 - when OMC excavated the replacement boat slip for former Boat Slip #3 on its WCP property, the excavated material was tested and found to contain high levels of creosote. The WCP site was investigated further and U.S. EPA discovered arsenic and polynuclear aromatic hydrocarbon (PAH) contaminants in the sandy soil and high levels of arsenic, benzene, phenol, and ammonia in the groundwater.

OU #3: PCB Containment Cells

The PCB Containment Cell operable unit was created when OMC performed the harbor cleanup action in 1990-1993. Three cells were created to contain both treated and untreated dredged spoils from the harbor and soil from the parking lot area on the OMC Plant 2 property. One cell is former Boat Slip #3, the location of a sewer outfall from OMC Plant 2 that discharged PCBs into the harbor. The other two ("East Containment Cell" and "West Containment Cell") are located on the north side of the OMC Plant 2 property between the North Ditch and the Plant 2 building. Each cell was constructed using a slurry wall around the cells keyed into the lake clay and a landfill liner system on top. The dredged spoils were placed into the former boat slip and on top of the ground surface for the other cells. Groundwater wells were drilled through the contained

materials into the native sand beneath the cells and they are periodically pumped to maintain an inward hydraulic gradient in case of a breach in the slurry wall. An inward hydraulic gradient helps prevent PCBs from escaping the containment cells.

OU #4: OMC Plant 2

OMC Plant 2 is an abandoned 1,000,000 ft² facility in which OMC manufactured outboard engine parts from about 1949 until it declared bankruptcy in December 2000. The facility was the source of PCB contaminants in the harbor. The U.S. EPA completed a remedial investigation and feasibility study (RI/FS) at the 65-acre OMC Plant 2 site in December 2006 and documented areas of PCB and PAH contamination in soil and in the abandoned building. The U.S. EPA also documented a large amount of chlorinated solvent in the ground and groundwater beneath the building.

Land and Resource Use

Waukegan Harbor currently is being used to serve both industrial facilities and recreational boaters. Larsen Marine Service, Inc. operates a marina along the north harbor area previously out of former Boat Slip #3 and currently out of Boat Slip #4. The Waukegan Port District runs a dock area in the southern area of the harbor. Recreational boaters can access Lake Michigan from these two areas. Several large industrial facilities receive raw materials via large supply ships or barges that are unloaded in Boat Slip #1 and Bombardier Motor Products, the current owner of the old OMC Plant #1 building, tests boat engines in the harbor along side its facility.

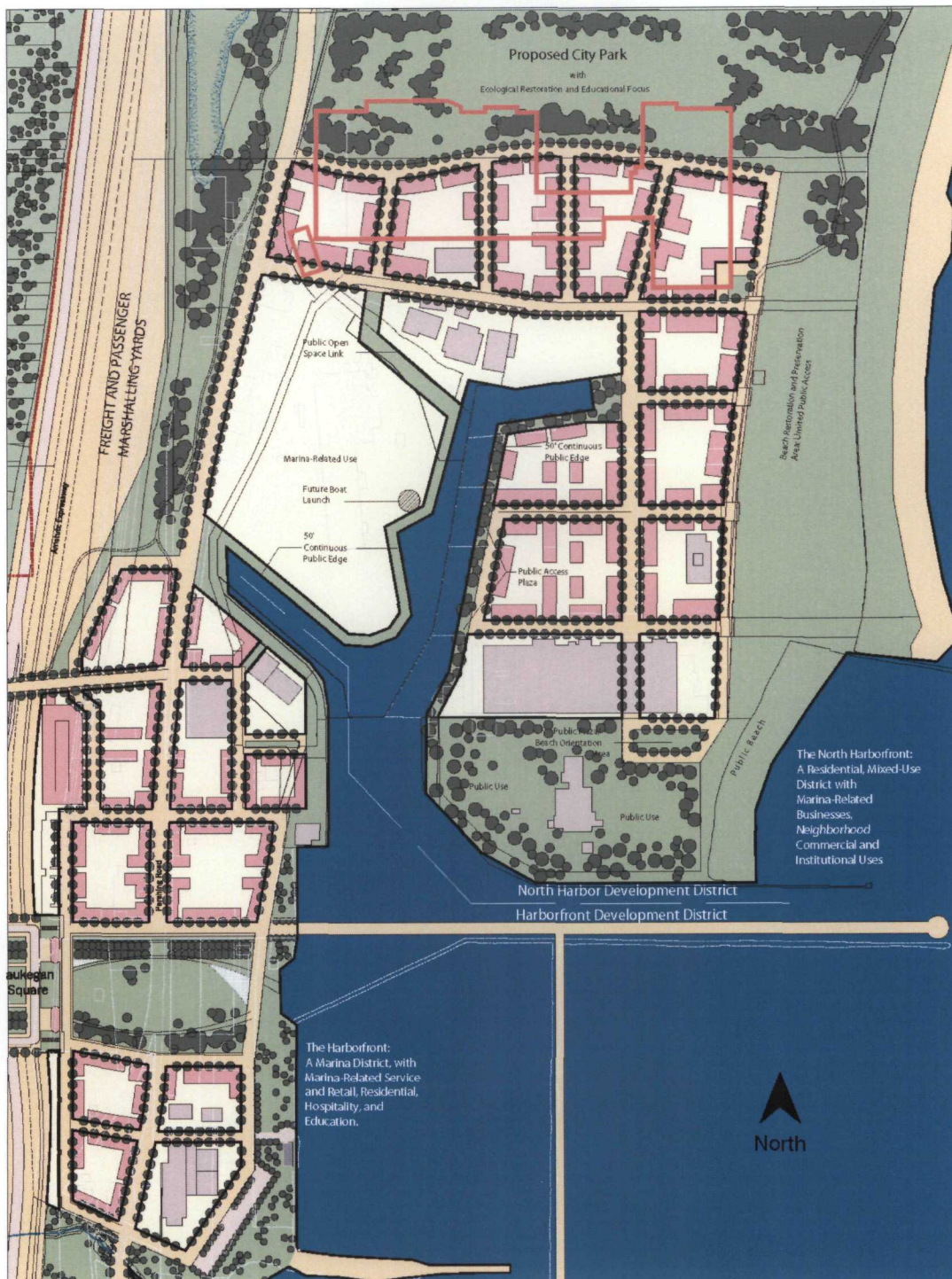
The Waukegan Coke Plant site is not being used at this time. The site is fenced and the city of Waukegan, the current property owner, performs routine maintenance tasks on the fence and periodically mows the grass.

The PCB Containment Cells are not being used at this time. However, the city has submitted to U.S. EPA and Illinois EPA a request to reconfigure the cap on top of the former Boat Slip #3 cell to accommodate building a boat storage building on the cell for use by Larsen Marine Service. Design specifications and blueprints are being drawn up by the city for the Agencies' approval in anticipation of a 2008 construction season.

The OMC Plant 2 site is abandoned and the property is not being used at this time, although the city has taken title to the property and has plans for future redevelopment.

None of the OMC site operable units use groundwater or surface water as a drinking water supply. The city water supply system is located just south of former OMC Plant 1 and the intake is located more than 1000 feet from the shore into Lake Michigan. All other facilities in the area are served by the city water supply system.

Waukegan has released a master plan for redevelopment of its lakefront area (see Figure 3 and compare with cover photo). Based upon this plan and current uses of the area, U.S. EPA projects the following land uses for the site during the next five years:



Legend

— OMC Plant 2 Building Outline

0 500 1000 Feet

Figure 3

Waukegan's Master Plan for
Harborfront and North Harbor
Development Districts

Source: Waukegan Lakefront-Downtown Master Plan/Urban Design Plan
(Skidmore, Owings & Merrill LLP, June 23, 2003)

OMC Plant 2 and Vicinity

Waukegan Harbor – The marine recreational and industrial use for the harbor will be maintained. Although the city has indicated that its master plan calls for de-industrialization of the harbor to facilitate the incorporation of an area-wide mixed use development, over the short term none of the businesses have indicated a willingness to leave their harbor locations. Also, several OMC site parcels need to be cleaned up before redevelopment can take place on them.

Waukegan Coke Plant – The WCP site was projected in the 1999 ROD to remain a commercial/industrial-use property due to its location between the then-operating OMC Plants 1 and 2. The city of Waukegan purchased the site from OMC following the OMC bankruptcy declaration and has rezoned it to high-density residential. Thus, the site-use assumption in the 1999 ROD is perhaps invalid. The city plans to release a request for proposals to redevelop the WCP site “within the next year” or so, presumably in accordance with its master plan (Figure 3) and its area rezoning efforts.

PCB Containment Cells – OMC was not expected to use the containment cells (except perhaps as surficial green space) so that the contents would not be disturbed. However, the city has submitted plans for the reuse of the surface of former Boat Slip #3 and its master plan calls for the surfaces of the two other containment cells to be configured for use as parkland.

OMC Plant 2 – The OMC Plant 2 building was previously projected to be reused as an industrial facility upon completion of necessary cleanup actions at the site. However, the city’s master plan calls for a mixed-use development on the OMC Plant 2 property plus establishment of parkland. Also, the September 2007 ROD for the site selected a demolition and disposal remedy for the OMC Plant 2 building. Thus, the previous site reuse assumption is no longer valid. Reuse will likely not occur during the next five years, though, because cleanup work will likely take at least that long to implement.

History of Contamination

OMC Plant 2 and Waukegan Harbor

From about 1961 to 1972, OMC purchased a hydraulic fluid that contained PCBs for use in its die-casting works at the OMC Plant 2 facility. During the manufacturing process some of the hydraulic fluid spilled into the floor drains which discharged to an oil interceptor system that discharged PCB-laden oil to the North Ditch. Some of the PCB-laden oil was also released directly to Waukegan Harbor. The harbor-area discharge outlet was located in the western end of Boat Slip #3 and the north property discharge was into the Crescent Ditch. As a result, large quantities of PCBs were released into Waukegan Harbor and on OMC property into the North Ditch, Oval Lagoon, Crescent Ditch, and in the Parking Lot Area. It was estimated that over 700,000 pounds of PCBs were deposited on OMC property and 300,000 pounds of PCBs were discharged into Waukegan Harbor. After the state of Illinois documented PCB contamination in the harbor in 1976, OMC reportedly sealed the discharge pipe to the harbor later that year.

Outboard Marine Corporation also operated several large vapor degreasers at the OMC Plant 2 facility to clean newly made parts with trichloroethene (TCE). Poor operating practices apparently led to TCE spills so that there is now a large groundwater contaminant plume beneath the OMC Plant 2 site.

Waukegan Coke Plant

The WCP property was the site of a railroad tie treatment plant from about 1908-1917 and the tie plant is the likely source of the creosote that was discovered in the soil that was excavated from the replacement boat slip for Larsen Marine Service. Later, from about 1928 until 1969, the site contained a manufactured gas plant and then a coke plant which was the source of the arsenic and PAHs in soil and groundwater. Outboard Marine Corporation purchased the WCP property in the 1970s, demolished the coke plant, and then used the property for parking, fire-fighting training, and snowmobile testing.

Initial Response Actions

The U.S. EPA, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Superfund, placed the OMC site on the Interim Priorities List in 1981 and on the National Priorities List (NPL) in 1983. The U.S. EPA initiated a remedial investigation (RI) at the site in 1982 to determine the nature and extent of PCB contamination in the harbor and on selected areas of OMC Plant 2 property (e.g. the North Ditch). Afterwards, U.S. EPA completed a feasibility study (FS) report in early 1984. The U.S. EPA analyzed various alternative cleanup remedies in the FS that would clean up the PCB contamination in the areas of concern. The U.S. EPA released a proposed cleanup plan for public comment and then signed a Record of Decision (ROD) in April 1984, selecting a harbor cleanup remedy that was estimated to cost \$21 million to implement. The U.S. EPA then began the remedial design phase. However, in late 1985, U.S. EPA was forced to suspend design work on the project due to the litigation between U.S. EPA and OMC that U.S. EPA initiated because OMC refused to grant us access to its property to perform the necessary tasks to complete the cleanup remedy design.

Superfund (CERCLA) was reauthorized in October 1986 while the OMC litigation was pending before the courts. The new law, the Superfund Amendments and Reauthorization Act (SARA), contained the Congressional preference for the selection of "permanent remedies which reduce the mobility, toxicity, or volume of hazardous substances" at NPL sites. Although RODs signed prior to October 1986 were not required to meet the new requirements of SARA, U.S. EPA reevaluated the 1984 OMC site ROD to develop a remedy more consistent with the requirements of SARA.

The new law also gave U.S. EPA access rights to NPL sites. Consequently, as U.S. EPA began to review the selected remedy for consistency with SARA, U.S. EPA and OMC agreed to end the litigation over access rights. Outboard Marine Corporation then submitted a proposal to clean up the site. In 1989, U.S. EPA, Illinois EPA, and OMC

entered into a Consent Decree under which U.S. EPA would oversee the cleanup of the site by OMC. Because the OMC remedy proposal varied from the 1984 ROD, U.S. EPA signed a ROD Amendment in 1989 that incorporated the changes into the selected remedy.

Outboard Marine Corporation began cleanup work in 1990. However, when OMC began to construct a replacement boat slip for Larsen Marine Service on the WCP property, OMC discovered that some of the excavated soil was contaminated with creosote. Outboard Marine Corporation completed the new boat slip excavation and constructed a temporary storage area to manage the contaminated soil until the rest of the harbor cleanup action was completed. Because the excavated area was within a portion of the former WCP property owned by OMC, U.S. EPA designated the area as OU #2 of the OMC site. The U.S. EPA also identified several other potentially responsible parties (PRPs) for the WCP site. One of them, North Shore Gas, completed an RI/FS in November 1998 and U.S. EPA signed a ROD for the cleanup of the WCP site in September 1999.

The U.S. EPA has conducted several time critical removal actions to stabilize and secure the OMC Plant 2 site since the summer of 2002. After the OMC bankruptcy estate petitioned to abandon the site in July 2002, U.S. EPA inspected the facility and then filed an objection to the proposed abandonment. The U.S. EPA negotiated a cleanup agreement in an administrative order on consent with the bankruptcy trustee under which the trustee performed several cleanup tasks at the facility under the oversight of our removal program. The trustee decontaminated machinery, disposed of *hazardous chemicals being stored in the facility*, drained electrical transformers of PCB-oils, and paid a small sum of money into the Superfund to cover future site removal action cleanup work by U.S. EPA. After the agreed-upon work was completed, the bankruptcy court approved the abandonment of the OMC Plant 2 site in December 2002.

Immediately after abandonment of the OMC Plant 2 site, U.S. EPA began a time critical removal action to further stabilize and clean up the site. The U.S. EPA disposed of additional chemical compounds, removed mercury-containing light switches, secured broken windows and doors to prevent casual access, and attempted the decontamination of PCB-contaminated concrete floors. The U.S. EPA also assumed responsibility for the operation and maintenance of the PCB Containment Cells (OU #3) for a one-year period until December 2003, at which time Illinois EPA assumed responsibility for this work.

In January 2006, U.S. EPA began a removal action in the duneland area near the East Containment Cell because high levels of PCBs were found in the sands outside the cell. The U.S. EPA excavated over 6,000 cubic yards (yds³) of sandy soil containing 10 to 14,000 ppm PCBs and disposed of the material in approved off-site facilities. The U.S. EPA also cleaned out several storm sewers leading from the OMC Plant 2 facility to prevent recontamination of the beachfront by residual PCBs discovered in the sewer lines. In January 2007, U.S. EPA undertook a final removal action to dispose of about

25 PCB-containing electrical transformers at the facility to prevent vandals from breaking the transformers open and dispersing PCBs into the environment. The U.S. EPA also removed an extensive amount of copper wire and electrical connectors from the plant to reduce the incentive for scavengers to break into the facility and potentially expose themselves to PCBs while scavenging for copper or other materials.

The U.S. EPA began a remedial investigation (RI) at the OMC Plant 2 site in 2004 to determine the nature and extent of contamination in site groundwater, sediment, and soil and within the OMC Plant 2 building. The U.S. EPA issued the *Remedial Investigation Report (for) OMC Plant 2* containing the study results and a human health and ecological risk assessment in April 2006. The U.S. EPA began a feasibility study (FS) in 2005 to examine site cleanup alternatives designed to protect human health and the environment and issued the *Feasibility Study Report (for) OMC Plant 2* in December 2006.

Basis for Taking Actions

Contaminants of Concern

Hazardous substances or pollutants that have been released at the OMC site (compiled from all OUs) include:

Soil: PCBs, PAHs, arsenic, chlorinated-volatile organic compounds (VOCs)

Groundwater: Arsenic, ammonia, phenol, benzene, chlorinated-VOCs

Sediment: PCBs

Contaminant Exposures

Actual or potential human exposures to contaminants in sediments, soil, and groundwater are associated with human health risks due to levels that exceed U.S. EPA's risk management criteria (i.e. excess lifetime carcinogenic risk exceeds the risk range of 1×10^{-4} to 1×10^{-6} and/or non-carcinogenic hazards exceed a hazard index (HI) quotient of 1) under reasonable exposure scenarios. Potential carcinogenic risks are very high for exposures to arsenic and benzene in the WCP site groundwater and chlorinated-VOCs in the OMC Plant 2 (OU 4) groundwater, as these compounds exceed Safe Drinking Water Act maximum contaminant levels (MCLs) or other protective levels. Ammonia levels are very high and create a high hazard index for WCP site groundwater.

Potential carcinogenic risks are very high for PCBs in surface soils on the OMC Plant 2 (OU 4) property, as PCB concentrations exceed 50 ppm in some areas. Arsenic and PAHs exceeded protective levels in WCP site soil for plausible exposure scenarios. Actual or potential environmental receptor exposures to PCBs in the harbor sediments caused PCB concentrations to accumulate to harmful levels in fish. Humans who catch

and eat the fish, as well as anything else that eat the fish will be exposed to potentially harmful levels of PCBs.

IV. Remedial Actions

Remedy Selection and Implementation

Waukegan Harbor

The U.S. EPA completed the first OMC Five-Year Review in 1997 and in it U.S. EPA detailed the cleanup action that occurred for the Waukegan Harbor site. The U.S. EPA had completed our review of the 1984 ROD in 1989 and issued a ROD amendment, modifying the Waukegan Harbor remedy to include the following cleanup tasks for OU #1 (and thereby creating OU #3 – the PCB Containment Cells):

- A new boat slip would be constructed on the east side of the upper harbor area on OMC property (the WCP property) to replace PCB-contaminated Boat Slip #3. Larsen Marine Service, the owner of Boat Slip #3, would be moved to the new boat slip.
- Boat Slip #3 would be permanently isolated from the upper harbor area by constructing a double-walled, braced, and soil-backfilled sheet pile cutoff wall around it. After the slip was isolated, a permanent PCB-containment cell would be built in the former slip by constructing an impermeable clay slurry wall with a minimum thickness of three feet around the slip with the slurry wall keyed 3 feet into the underlying clay till.
- Sediments from Boat Slip #3 with PCB concentrations in excess of 500 ppm would be removed from the former slip and treated on-site (see below). The upper harbor would be dredged and contaminated sediments removed to a 50 ppm PCB cleanup level. The dredged materials would be placed in the newly-constructed former Boat Slip #3 PCB Containment Cell.
- Two additional containment cells (termed the “East” and “West” Containment Cells) would be constructed using the above design for the former Boat Slip #3 containment cell. The East Containment Cell would encompass part of the OMC Plant 2 Parking Lot area and land to the east of the lot. The West Containment Cell would encompass the Crescent Ditch and Oval Lagoon area. Before constructing the West Containment Cell, soils with PCBs in excess of 10,000 ppm will be excavated and removed for treatment. The East Containment Cell would contain soils from the Parking Lot area. These soils would not receive on-site treatment because they were generally below the treatment criterion.
- Soils and sediments excavated from the former Boat Slip #3, North Ditch, Crescent Ditch, and Oval Lagoon areas that exceed the treatment criteria (500 ppm in Boat Slip #3, 10,000 ppm on land) would be thermally treated on-site to remove PCBs for disposal off-site in accordance with all applicable federal and state law. The treated material would be placed in the West Containment Cell.

- A treatment facility would be constructed for treating water generated during the remedial construction activities. Dredge water would be treated by sand filtration. Other water generated during the course of the cleanup would be treated utilizing the sand filtration step to remove sediments from the water, followed by carbon adsorption.
- Once all of the materials have been deposited in the containment cells, the cells would be closed and capped with a high density polyethylene (HDPE) liner and soil cover. An extraction well system would be installed in the cells and designed to prevent the migration of PCBs from the cells by maintaining an inward hydraulic gradient.
- A permanent water treatment facility would be constructed to treat water extracted from the containment cells. Treated water would be discharged to the North Shore Sanitary District or on site.

Outboard Marine Corporation, as directed by the Consent Decree, created an entity called the Harbor Trust to effect the cleanup remedy. In April 1989, the Harbor Trust hired a remedial contractor to design and perform the cleanup of the site. The major remedial activities at the site included:

- Remedial design for the treatment and containment of PCB-impacted soil and sediments in Waukegan Harbor and the on surrounding land.
- Excavation and construction of a new boat slip for the relocation of Larsen Marine Service from former Boat Slip #3.
- Isolation of former Boat Slip #3 for the removal of PCB-contaminated sediments for treatment and for the containment of upper harbor sediments by installing vertical sheet piling, slurry walls, and synthetic liner cap and soil cover.
- Hydraulic dredging of designated sediments in former Boat Slip #3 for thermal treatment and hydraulic dredging of designated Upper Harbor sediment for placement in former Boat Slip #3 for containment.
- Construction of two containment cells (the East and West Containment Cells) on the northern area of the site by installing slurry walls and capping with synthetic liners and soil covers.
- Restoration of the North Ditch by excavation of designated sediments, placement in the West Containment Cell, and backfilling the North Ditch with clean sand.
- Construction and operation of water treatment plants to treat waters generated during construction and operation of the remedial action.
- Installation and operation of an extraction well system at each containment cell to maintain an inward hydraulic gradient.

Major construction activity was completed in 1993 and final construction work was completed in December 1994. By then, OMC's contractor had excavated over 30,000 cubic yards of sediment and soil from the harbor and upland areas and had thermally treated a total of 12,750 tons of PCB-contaminated soil and sediment. The treatment process consisted of anaerobic thermal desorption of the PCB oil from the soil and sediment. About 30,000 gallons of PCB oils were removed from the contaminated soil and disposed of off-site and the treated soil was placed into the containment cells.

As the remedy was performed, a number of modifications were made to the system design due to site conditions. The more significant modifications include:

- The slurry walls were, on average, keyed 3.5 rather than 3.0 feet into the underlying till.
- Obstructions at the surface of the clay/till layer at all three containment cells were discovered while attempting to set the slurry wall. Two of the three cells required modification to the slurry wall alignment.
- Soils contaminated with creosote were discovered in the area proposed for the replacement boat slip. As a result, the location of the new slip and slurry wall alignment were changed, and the WCP property was designated as OU #2.
- A temporary storage area was constructed on the WCP property to manage the contaminated soils removed from the replacement boat slip excavation.

Outboard Marine Corporation began to operate and maintain the PCB Containment Cells in 1993 and had done so until it declared bankruptcy in December 2000. It submitted quarterly reports that chronicled the work performed to maintain the inward hydraulic gradient, analyze groundwater samples, and maintain the HDPE and topsoil cap over the cells.

Initially, OMC maintained an inward gradient by pumping each containment cell nearly dry and treating the pumped water with a mobile carbon-filtration system. This severe approach required a significant draw down in each cell and may have resulted in increased groundwater inflow into the containment cells and, subsequently, a larger volume of water requiring treatment. In an attempt to minimize the volume of water needing treatment and for ease of long-term management, OMC added permanent dual series carbon treatment systems to each of the containment cell extraction systems in 1996. This modification allowed for a more routine extraction rate, yielding a less severe hydraulic gradient within a containment cell.

Waukegan Coke Plant

The U.S. EPA signed a ROD for the WCP site (OU #2) in September 1999. The selected remedy consists of the following tasks:

- The stockpile of creosote-contaminated soil generated from the new boat slip construction and PAH-impacted soil from other areas of the site would be excavated and sent off site for treatment by power plant co-burning or for disposal in a suitable landfill.
- Arsenic-contaminated soil would be either solidified/stabilized in place or excavated and disposed of in an off-site landfill.
- Marginally-contaminated soils (as defined in the ROD) would be covered by a combination of asphalt (parking lot), building, and/or vegetated soil cover (cap).
- A Soil Management Plan would be developed for the site to aid in site re-use efforts.
- A mobile pump and treat program would be developed to remove grossly contaminated groundwater from beneath the site. Water would be pumped from individual areas, termed "cells," on a rotating basis and treated to remove contaminants. Treated water would be re-injected into the aquifer upgradient from the pumping wells.
- After groundwater cleanup targets are met through the pump and treat task, a Monitored Natural Attenuation (MNA) remedy would be implemented to ensure that the remaining groundwater contaminant levels decrease to acceptable levels (*i.e.* meet drinking water standards) over time.
- Institutional controls, such as deed notices, and groundwater-use prohibitions would be placed on the property to ensure future site uses are compatible with the cleanup action.

The site soils would be cleaned up to achieve a residual excess lifetime carcinogenic risk of 1×10^{-5} based on an industrial or recreational site re-use scenario. Groundwater would be cleaned up to achieve MCLs for respective contaminants or protective levels, as appropriate, for beneficial uses or protection of Lake Michigan ambient water quality.

The U.S. EPA signed an Administrative Order on Consent with North Shore Gas Company and General Motors Corporation in July 2001 to begin the remedial design phase of the cleanup. The two PRPs began the design by further sampling the soils to more fully delineate the extent of soil contamination and to determine the feasibility of power plant co-burning versus off-site disposal in a landfill.

The two PRPs had conducted a groundwater pilot test in 2000 to observe the effects of different pumping rates for the groundwater cleanup action. They used the data during the remedial design phase to set up a groundwater model for the site for use in determining optimum pumping rates. They later performed a groundwater treatability test to determine applicable methods to remove the high levels of ammonia, arsenic, benzene, and phenol from the contaminant plume.

The PRPs completed the soil cleanup design plans and specifications in January 2004 and the groundwater cleanup design plans and specifications in March 2006.

The U.S. EPA signed a Consent Decree with five PRPs in October 2004 to begin the remedial actions at the WCP site. The first phase of cleanup involved the soils work. Workers mobilized to the site in November 2004 and began excavation work. Final soils cleanup tasks were completed in November 2005 when a 6- to 10-inch layer of clean soil was placed over the site and seeded. The city of Waukegan now maintains the clean soil cover.

The groundwater cleanup work was scheduled to begin in spring 2006 with construction of a treatment plant on the adjacent OMC Plant 2 property. Bidding delays caused work to be postponed until spring 2007. Once construction work is completed in about July 2008, a 3- to 8-year pump-and-treat program will commence.

OMC Plant 2

When OMC declared bankruptcy in December 2000, it began a process of shedding all its assets, including its Waukegan-area properties. OMC Plant 1 was sold to Bombardier Motor Products, Inc. and was not believed to require action under CERCLA (but it could be the subject of RCRA permitting issues). OMC Plant 2 had no buyers, so the bankruptcy trustee petitioned the bankruptcy court to abandon the facility. The U.S. EPA and Illinois EPA filed an objection, because during an initial RCRA site inspection in 2001 and during a subsequent Superfund removal site assessment in February and March 2002, U.S. EPA discovered that a number of environmentally hazardous conditions existed in and outside the plant. Also, OMC turned over internal documents to us that showed that a large chlorinated-VOC plume existed beneath OMC Plant 2.

Both the bankruptcy trustee and U.S. EPA performed removal actions at the site from 2002-2007 (see **Initial Response Actions**, above). The U.S. EPA also completed a remedial investigation and feasibility study at the site in December 2006. In September 2007, U.S. EPA signed a ROD that called for demolition of the PCB-impacted portions of the Plant 2 building and excavation of PCB- and PAH-impacted soil and sediment with off-site disposal of all contaminated materials. The U.S. EPA has started the remedial design for this work and project that the design will be completed by December 2007. Cleanup work could then begin contingent upon funding availability. The issue of institutional controls was deferred in the 2007 ROD until such time when U.S. EPA is ready to select a groundwater cleanup remedy at the site in about December 2008.

The U.S. EPA also began a pilot-scale treatability test for cleanup of chlorinated solvents in site groundwater. This work is estimated to be completed in March 2008 and we expect to be able to use the testing data to publish a feasibility study and a proposed cleanup plan for the groundwater by September 2008.

Institutional Controls

Institutional controls (ICs) are non-engineered instruments such as administrative and/or legal controls that can be used to help minimize the potential for human exposure to site contaminants and/or protect the integrity of a cleanup remedy. There are several different types of ICs and sometimes multiple IC types are used or “layered” for extra measures of safety. Governmental controls are ICs issued or promulgated by local municipalities. For example, a city may pass and enforce a local ordinance to prohibit the placement and/or commence the abandonment of private drinking water wells within city limits if a nearby cleanup site had a groundwater contaminant plume emanating beneath the city. The ordinance would be considered an IC in that enforcement of the ordinance by the city would help prevent human exposure to site contaminants in the groundwater.

Other ICs include proprietary controls, which are property-use restrictions issued by property owners; enforcement controls which are site-use agreements contained in a document such as a consent decree (“enforcement agreement”); and, informational controls, such as fish-consumption advisories, which are issued to help inform the public of the potential hazards of residual contamination and to provide guidelines for protecting oneself while still using the site.

The U.S. EPA, as part of a cleanup action, may require placement and compliance with various types of ICs to ensure long-term protectiveness for any site areas which do not allow for unlimited use or unrestricted exposure (UU/UE) to residual contaminants.

Waukegan Harbor

In February 2006 the Illinois Department of Public Health (IDPH) issued a state-wide sports fish consumption advisory update for Illinois waters that included “Waukegan North Harbor of Lake Michigan.” The U.S. EPA considers the IDPH sports fish consumption advisory to be an informational IC for the OMC site. IDPH recommended that meals of white sucker and sunfish taken from the harbor be limited to one per month due to elevated levels of PCBs in the fish. All other species caught in the harbor should follow the advisory for Lake Michigan fish concerning PCB and methylmercury levels. (See IDPH website at www.idph.state.il.us.)

Neither the 1984 ROD nor the 1989 ROD Amendment issued for the cleanup of Waukegan Harbor contemplated or selected the use of ICs as a part of the cleanup remedy for this operable unit. Very likely this was because OMC was still operating at the time and owned the properties on which the PCB Containment Cells were to be constructed as well as the parking lot area in which part of the cleanup was to occur. Thus, as the active owner of the property, OMC would have prohibited any interference with the selected remedies.

Now that OMC has abandoned or sold its Waukegan-area properties, it cannot prohibit interference with the selected remedies. Since U.S. EPA has determined that the 50

ppm harbor sediment PCB cleanup level is not protective, U.S. EPA is planning to issue for public comment in 2008 a Proposed Plan (for ROD Amendment) in which a lower PCB cleanup level may be recommended and selected for the harbor sediments. The selected remedy may also include ICs to ensure protectiveness of any newly selected remedial actions in the harbor.

Waukegan Coke Plant

The 1999 ROD included ICs as part of the overall remedial action at the site:

“Institutional controls, such as deed notices, and groundwater-use prohibitions would be placed on the property to ensure future site uses are compatible with the cleanup action.”

No progress was reported concerning the placement of ICs on the WCP site in the second Five-Year Review Report because cleanup work had not yet begun when the report was released in September 2002.

In September 2004, U.S. EPA issued an Explanation of Significant Differences (ESD) for the site partly in response to concerns about the reuse of the site in accordance with the city of Waukegan’s 2003 master plan for redevelopment of the lakefront (Figure 3). The city had rezoned the site on October 7, 2002, to high-density residential from industrial. The city’s master plan called for a mixed-use redevelopment of the property despite the cleanup levels being set at commercial/industrial levels. The ESD echoed the 1999 ROD regarding ICs:

“Institutional controls (e.g. site-use restrictions, deed restrictions, groundwater-use restrictions, and utility easements) will also be placed at the site.”

After U.S. EPA issued the ESD, U.S. EPA signed a remedial action Consent Decree in October 2004, with the PRPs and others, including the city and Larsen Marine Service, in which certain ICs were required to be implemented. Under the Consent Decree, the Settling Defendants have agreed to refrain from using the site in any manner that would interfere with the remedy components. The city has agreed to record a restrictive covenant that prohibits incompatible uses and is working on refining the terms of the ICs at present. Complicating the procedure is the myriad of very old easements criss-crossing the parcel and litigation between the city and Larsen Marine Service over ownership of parts of the parcel. The city has indicated that it is trying to remove some or all of the old easements as they are no longer needed (e.g. railroad access) to “clean up” the property title. Also, the IC terms need to be tailored so that they apply to potential future owners of the site (e.g. condominium associations) and not just the current owner(s). The ICs are subject to review and approval by U.S. EPA and Illinois EPA under the Consent Decree. The U.S. EPA projects that the ICs will be ready for application to the site by about 2008 or 2009.

In the interim both Larsen Marine Service and the city, as site property owners, are

required under the 2004 Consent Decree to record notice of the 2004 Consent Decree with the Lake County Recorder on the property deeds. To date Larsen Marine Service has recorded such notice on its deeds and the city is working to do so as well.

The U.S. EPA has learned that the city is also working on an ordinance prohibiting groundwater use in certain areas of the city because of contaminant issues. The ordinance may be ready for passage by the city council in late 2007 or early 2008. The ordinance, a governmental control, could likely apply to the OMC site, depending on its terms, and would be enforced by the city. Figure 2 shows the area of extent of OU #2 and thus where the ICs required by the Consent Decree would apply.

PCB Containment Cells

As recounted above, at the time U.S. EPA issued the 1984 ROD and 1989 ROD *Amendment for Waukegan Harbor*, OMC was still operating at the site and could exert control over future land use. The city has since acquired title to OMC Plant 2, which includes the PCB Containment Cells, and has plans to reuse the property. The U.S. EPA believes that ICs may be necessary to protect the integrity of the containment cells and therefore for the remedy to be protective in the future. The U.S. EPA intends to address the IC issue for the East and West Containment Cells in the future OMC Plant 2 groundwater cleanup ROD in about December 2008. Since the former Boat Slip #3 containment cell is targeted for reuse by the city potentially much sooner than the other cells, U.S. EPA plans to address ICs for former Boat Slip #3 in an ESD that we plan to issue as soon as early 2008. Figure 2 shows area of extent of OU #3 and thus where ICs for the operable unit will likely need to be applied.

OMC Plant 2

The U.S. EPA signed a ROD in September 2007, for the OMC Plant 2 site that called for demolition of the PCB-impacted Plant 2 building and excavation of PCB- and PAH-impacted soil and sediment with off-site disposal of all contaminated materials. Since the selected building and soil cleanup actions in the September 2007 ROD would allow for unlimited use or unrestricted exposure in the targeted areas to be cleaned up, ICs would not be needed as a part of these remedies. There are, however, groundwater contaminants under the OMC Plant 2 above drinking water standards. Due to uncertainties with regard to the direction of future Waukegan Harbor cleanup work and any OMC Plant 2 groundwater cleanup work, U.S. EPA determined that it would be prudent to evaluate the need for ICs in upcoming decision documents for the harbor, PCB Containment Cell, and OMC Plant 2 groundwater matters. Table 2 (next page) summarizes the ICs status for the OMC site.

Table 2: Institutional Controls Summary Table

Site areas that do not support unlimited use or unrestricted exposure (current conditions)	IC Objectives	Title of Institutional Control Instrument Implemented or Planned
Waukegan Harbor (OU #1) - Sediment - Fish	To be determined through remedy selection process Prevent over-consumption of contaminated fish	To be determined through remedy selection process State-issued fish consumption advisory February 2006
Waukegan Coke Plant (OU #2) - Soil Note: Although cleanup is completed, the cleanup levels support commercial/industrial reuse only.	Prohibit incompatible uses	The 2004 Consent Decree prohibits incompatible uses and requires that a Restrictive Covenant be recorded at Lake County recorder's office as well as reservation of restrictive covenant in any future deed.
Waukegan Coke Plant (OU #2) – Groundwater	Prohibit groundwater use until "drinking water" standards are achieved	The 2004 Consent Decree prohibits groundwater use and requires Restrictive Covenant to be recorded at Lake County recorder's office. Planned: Possible city ordinance prohibiting such use.
PCB Containment Cells (OU #3) - former Boat Slip #3 - East and West Cells	Prohibit incompatible uses to protect integrity of remedy (to be determined through remedy selection process)	To be determined through remedy selection process
OMC Plant 2 (OU #4) - Groundwater	To be determined through remedy selection process	To be determined through remedy selection process

The U.S. EPA will produce an IC Plan in 2010 when the last of the cleanup construction work at the OMC site is currently targeted for completion. The IC Plan will cover all the elements necessary to evaluate the status of ICs for the OMC site at that time.

Operation and Maintenance

Waukegan Harbor

No operation and maintenance (O&M) tasks are scheduled or underway for the Waukegan Harbor operable unit, although the Illinois Department of Natural Resources (IDNR) attempts to take fish samples from the harbor on a yearly basis to test them for PCB levels. The IDNR provides the sampling results to U.S. EPA as it becomes available.

Waukegan Coke Plant

The soils cleanup action was completed by the WCP site PRPs in November 2005. The city of Waukegan, the current site owner, pursuant to the terms of the 2004 Consent Decree is now in charge of maintaining the site fence and mowing the grass on the 6- to 10-inch soil cover over the site. Groundwater cleanup work has not yet begun. Costs incurred by the city for this O&M work are not known and are reportedly minimal.

PCB Containment Cells

Routine O&M of the PCB Containment Cells is performed by the city of Waukegan pursuant to the terms of a 2005 Consent Decree between the city and U.S. EPA and Illinois EPA under which the city took title to the abandoned OMC Plant 2 property. Operation and Maintenance consists of maintaining an inward hydraulic gradient in the containment cells, inspecting and repairing the containment cell caps and pumping systems, and monitoring water levels and water quality around the cells. Outboard Marine Corporation had performed these tasks under the Consent Decree until it declared bankruptcy in December 2000. The bankruptcy trustee performed these tasks following the bankruptcy declaration until it was permitted to abandon OMC Plant 2 in December 2002. The U.S. EPA had assumed the duties for one year (2002-2003) and then Illinois EPA (2003-2005) performed the O&M tasks until the city took them over in late 2005.

The city maintains an inward hydraulic gradient across the length and width of each PCB containment cell by pumping groundwater from each cell. The pumped water is treated with activated carbon to remove PCBs before it is discharged to the harbor or the North Ditch. The city must also demonstrate the inward gradient by periodically taking water level measurements inside and outside of the cells. The city is required to issue quarterly reports to U.S. EPA detailing the O&M actions it undertook at the cells.

The city also routinely inspects and makes timely repairs to the covers of the three containment cells as appropriate. The surfaces of the cell covers consist of top soil

overlying a drainage layer and a high density polyethylene synthetic liner. The vegetative cover is inspected each spring. Any gullies or washouts in the top soil are backfilled, compacted, reseeded and mulched with an appropriate material. Stressed or dead areas of vegetation will be similarly treated. The vegetated areas are mowed at least twice per year and fertilized occasionally.

The city periodically monitors groundwater quality around the containment cells. This requirement consists of detection monitoring, compliance monitoring, and corrective action programs. The detection monitoring program addresses the routine, ongoing monitoring of the containment cell function. Compliance monitoring is implemented if detection monitoring identifies a change that may suggest deterioration in the function of any containment cell. If compliance monitoring determines that contaminants (PCBs) from a containment cell are migrating beyond the slurry walls, then corrective action will be taken. A total of 12 ground water wells were installed after completion of the slurry walls. These wells are analyzed for PCBs quarterly. The city has informally estimated that its O&M costs for the PCB Containment Cells approach \$20,000 to \$25,000/year.

OMC Plant 2

No O&M tasks are scheduled or underway for the OMC Plant 2 operable unit because no remedial actions have yet occurred at the site.

V. Progress since the Last Review

The U.S. EPA signed the second Five-Year Review Report for the OMC site on September 26, 2002. Since then U.S. EPA has performed a considerable amount of work at the site.

Waukegan Harbor

The U.S. EPA stated in the second Five-Year Review Report that the 50 ppm PCB cleanup level for the Waukegan Harbor remedial action needed to be re-evaluated to determine if it was protective of human health and the environment. Although PCB levels had fallen in fish samples taken subsequent to the harbor dredging remedy completed in 1993, PCB levels in harbor fish were still above the federal Food and Drug Administration (FDA) action level for consumption. The U.S. EPA recommended further fish and sediment sampling to examine impacts of the sediment PCB levels on fish PCB levels.

Since the last review, U.S. EPA and Illinois EPA have performed the recommended additional testing of harbor sediment and fish for PCB levels and U.S. EPA performed a human health risk assessment using current test data. The U.S. EPA calculated that a 0.2 ppm PCB level (surface-weighted average concentration (SWAC)) would be a protective cleanup level for harbor sediment, based on the human health risk assessment. Sediment sampling events in January 2003 and January 2005 helped delineate the nature and extent of residual PCBs in the harbor. Residual PCBs

generally average 2-3 ppm in the sediment with a “hot spot” of about 30 ppm found in one small area.

Plans were underway from about 2003-2007 to try to clean up the harbor as soon as possible to the calculated protective PCB cleanup level (0.2 ppm) under the authority of the recently enacted federal Great Lakes Legacy Act (GLLA). A group of area stakeholders, including U.S. EPA, Illinois EPA, local industries, the city of Waukegan, Lake County (IL), and others gathered to evaluate existing data, determine data gaps, obtain additional data to fill the gaps, and put together a proposed cleanup plan to be paid for with GLLA funds with a required 35 percent share of local funding. Plans have now shifted to formulate and implement a harbor cleanup action under the Superfund process using the recently generated data.

Waukegan Coke Plant

The U.S. EPA stated in the second Five-Year Review that the remedy at the Waukegan Coke Plant operable unit is “expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.” The U.S. EPA also noted that the city was planning to rezone the property from industrial to residential that could affect future protectiveness.

Since the last review, the soil and groundwater remedial designs and the soils cleanup work have been completed by the PRPs. Groundwater pump-and-treat work is scheduled to begin in July 2008 after construction of the treatment and pumping systems is completed.

The city did rezone the property to high-density residential in October 2002. However, U.S. EPA, with concurrence from Illinois EPA, released an ESD for the site in October 2005 that changed two cleanup standards for the site soil and also provided a framework for reuse as contemplated by the city after the 1999 ROD cleanup actions were completed. A combination of ICs, placement of at least 3 feet of clean soil over the site, and the use of engineered controls in constructing building foundations to manage potential indoor air intrusion hazards was set forth as the minimum effort needed to reuse the site in accordance with the new zoning. The city has agreed to implement these methods in its planned reuse efforts at the site.

PCB Containment Cells

Various entities have performed the O&M tasks for the PCB Containment Cells since the second Five-Year Review. The U.S. EPA (2002-2003), Illinois EPA (2003-2005), and the city of Waukegan (2005-present) have maintained the inward hydraulic gradient in the cells and inspected and repaired the covers on the cells. The U.S. EPA had raised the issue in the second Five-Year Review that OMC Plant 2 would soon be abandoned and that OMC would thus no longer be operating and maintaining the cells, so another entity would need to take over this effort. Outboard Marine Corporation

Plant 2 was abandoned by OMC in December 2002, but the O&M tasks were not suspended and thus the protectiveness of the remedy was not jeopardized.

OMC Plant 2

The U.S. EPA stated in the second Five-Year Review that OMC Plant 2 was to be abandoned and that it should be nominated by Illinois EPA to be placed on the NPL. Because the site was the source of PCB contamination in the adjacent harbor, U.S. EPA determined that it was not necessary to formally nominate the site to be placed on the NPL and thus U.S. EPA designed OMC Plant 2 as OU #4 of the OMC site.

Accordingly, U.S. EPA completed a remedial investigation and feasibility study at the OMC Plant 2 site from April 2004-December 2006 and, based on the results, U.S. EPA issued a ROD for cleanup of the abandoned building and soil and sediment in September 2007. The U.S. EPA also began a pilot-scale groundwater treatability study in 2006 to help determine whether a cost-effective and efficient *in situ* groundwater cleanup method could be designed for the site. The U.S. EPA expects to complete the pilot-scale testing in about March 2008 and to issue a ROD for groundwater cleanup in about December 2008.

Table 3 summarizes the issues U.S. EPA identified in the second Five-Year Review Report and the actions U.S. EPA has taken to mitigate them.

Table 3: Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
OMC Plant 2 to be abandoned	OMC Plant 2 to become operable unit #4 of OMC site	U.S. EPA and Illinois EPA	6/30/2003	OMC Plant 2 is OU#4 of the OMC site.	Approx. December 2002.
50 ppm PCB in [the harbor] sediments did not fully reduce fish PCB levels	Further sample the sediment and fish in harbor; re-evaluate PCB cleanup level	U.S. EPA and Illinois EPA	9/30/2003 sampling; 9/30/2004 evaluate safe PCB level	Sediment sampling and risk evaluation performed. Recommended cleanup level is 0.2 ppm.	Sampling in January 2003 and 2005; risk evaluation in 2006.
City of Waukegan to rezone Coke Plant property to residential	Identify impacts on selected remedy, if any	U.S. EPA and Illinois EPA	6/30/2003	Soil cleanup levels re-evaluated; two were lowered. U.S. EPA issued an ESD concerning site re-use requirements.	ESD issued September 2004

VI. Five-Year Review Process

Administrative Components

The U.S. EPA began the third Five-Year Review at the OMC site in October 2006. The

site remedial project manager (RPM), during routine discussions about the various operable units of the OMC site, orally notified the WCP site PRPs, the city, and Illinois EPA that he was beginning the review and that they were encouraged to comment on the review process. The RPM also sent Illinois EPA a letter in October 2006 to notify it that U.S. EPA was starting the third Five-Year Review at the OMC site.

Document Review

The U.S. EPA reviewed several site documents or reports for the various operable units at the OMC site. A complete list of documents reviewed is included as Attachment 1 at the end of this report.

Community Involvement

The U.S. EPA orally notified the Waukegan Community Advisory Group (CAG) in the fall of 2006 that the third OMC Five-Year Review was beginning. The RPM notified the members by attending and announcing the start of the review at a monthly CAG meeting in October.

The U.S. EPA also notified the Waukegan community of the start of the third Five-Year Review at the OMC site by publishing an advertisement in a newspaper of general circulation. Because there is a large Hispanic community in Waukegan, U.S. EPA placed a second ad, in Spanish, in a newspaper that serves this part of the community. Copies of the advertisements are included as Attachment 2 at the end of this report. In each case U.S. EPA invited community members to submit any comments to us. The U.S. EPA received no comments concerning the third Five-Year Review for the OMC site.

Data Review

A lot of new data were generated for the OMC site operable units since the second Five-Year Review was completed. The U.S. EPA performed an RI/FS at the OMC Plant 2 site and undertook very nearly the equivalent of a Superfund RI/FS in Waukegan Harbor when performing our GLLA-related analyses of the harbor sediment PCB levels. Routine O&M data were generated for the PCB Containment Cells and many soil samples were taken post-excavation at the WCP site to demonstrate compliance with the cleanup levels.

Waukegan Harbor

The U.S. EPA performed two major sampling events in Waukegan Harbor in January 2003 and January 2005 to determine the extent of residual PCB levels in harbor sediment. Over 200 samples were taken from more than 75 sample core locations throughout the entire harbor (instead of from only the northern harbor area that was previously cleaned up by OMC – see Figure 2). The U.S. EPA was then able to map out the areas of concern in the harbor based on a 1 ppm PCB concentration contour.

Waukegan Coke Plant

Two types of reports were generated for the WCP site since the last Five-Year Review in addition to the two sets of design plans and specifications (for soil and groundwater cleanup). The U.S. EPA reviewed a Technical Memorandum ("Tech Memo") issued by the WCP site PRPs in 2004 in response to the city's 2002 rezoning action. The PRPs re-examined the 1999 ROD cleanup standards in the Tech Memo in relation to proposed new site reuse considerations and potential changes in toxicity values for the chemicals of concern at the site. Using the same risk assessment approach assumptions as in the 1992-1999 RI/FS, plus examining the newly emerging indoor air intrusion pathway of concern, the PRPs proposed that U.S. EPA lower the cleanup levels for two chemicals of concern (arsenic and naphthalene) and maintain the rest at the 1999 ROD levels. The PRPs also suggested that certain other measures, to be used in concert with lowering the two cleanup levels, could be employed to make the site usable for residential development. These measures include the use of ICs, extra cover soil, and engineered barriers to protect against indoor vapor intrusion through building foundations.

The U.S. EPA also reviewed the 2006 Remedial Action Report issued by the PRPs for the soils cleanup work. The report detailed the number of sidewall and bottom samples taken in the excavated areas and demonstrated achievement of soil cleanup standards.

PCB Containment Cells

The U.S. EPA examined quarterly reports issued for the routine O&M of the cells. Water level data from monitor wells confirmed an inward hydraulic gradient was maintained in each of the cells and water sample analysis data confirmed that no PCBs were discharged from water being pumped and treated to maintain the inward gradients. Reports were generated by the Illinois EPA and then the city of Waukegan after the city took over routine O&M of the cells.

OMC Plant 2

The U.S. EPA performed an RI/FS at the OMC Plant 2 site from 2004-2006. Many soil and groundwater samples were taken at the site outside of the Plant 2 building and many concrete core samples and surface wipe samples were taken inside the building to determine the nature and extent of site contaminants. The 2006 RI/FS Report details this work.

Site Inspection

The U.S. EPA regularly inspects the OMC site during site visits for meetings or oversight of ongoing cleanup actions. During the various OMC site inspections U. S. EPA has observed people fishing in Waukegan Harbor. The U.S. EPA has also seen that the PCB containment cells covers have not been breached and that they are regularly mowed.

During the most recent inspection of the WCP site on August 16, 2007, U.S. EPA noted that most of the warning signs on the site fence were either missing or obscured by vines. The RPM orally notified the city the next day so that it could remedy the situation. The fence itself was in good condition so that casual trespass is being prevented.

The OMC Plant 2 facility is somewhat secured by a chain-link fence. The city regularly patrols the site and makes needed repairs to broken windows or doors to help prevent casual trespass. Recent cleanup construction activity at the site also helps keep casual trespassers away.

Interviews

The U.S. EPA did not formally interview members of the public about the protectiveness of the remedial actions at the OMC site because cleanup work is still underway.

VII. Technical Assessment

The U.S. EPA asked the following three key questions during our technical assessment of the OMC site to provide the basis for our protectiveness determination(s). Our conclusions are based on the information reviewed in the previous sections:

Question A: Is the remedy functioning as intended by the decision documents?

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Question A -Is the remedy functioning as intended by the decision documents?

Answer A – **Yes.**

This question applies to the PCB Containment Cells and to the surface of the WCP site, as these are the only portions of the site cleanups that have been completed.

The U.S. EPA's analysis shows that the PCB Containment Cells are functioning as intended by the 1984 Waukegan Harbor ROD and 1989 ROD Amendment. The containment cells are easily maintained by the city of Waukegan and U.S. EPA has noted no outward hydraulic gradients or movement of PCBs from the cells.

The U.S. EPA identified no opportunities to optimize performance of O&M for the cells as this was done during a previous Five-Year Review period. Outboard Marine

Corporation had installed carbon treatment units at each cell to minimize the amount of groundwater pumped from each cell to achieve an inward gradient.

Equipment replacement rates appeared to be normal. Sufficient resources may need to be directed to the site by U.S. EPA, Illinois EPA, or others to maintain the effectiveness of the containment cells over the long term, for the city has only agreed to undertake "routine" O&M of the cells. U.S. EPA and Illinois EPA would have to assume responsibility for repairing any catastrophic failures of cells.

The soils cleanup action was completed at the WCP site in November 2005. The city now maintains the 6-inch clean soil cover that was placed over the site and seeded. The city also maintains the site fence and warning signage, preventing casual trespass at the site. All institutional controls have not been implemented at the WCP site as yet.

Question B - Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Answer B – No.

This question applies to the Waukegan Harbor and WCP operable units.

Changes in Cleanup Levels

With respect to the Waukegan Harbor operable unit, the cleanup level for PCBs in harbor sediments was set at 50 ppm in the 1984 ROD. This level was thought to be protective of human health in the harbor area based on a sought-for reduction of PCB levels in fish in the harbor that potentially are consumed by fishermen and their families. A reduction of PCB levels in the sediment would reduce PCB levels in fish which, in turn, would reduce the amount of PCBs ingested by those who eat the fish. Following the dredging of the harbor, fish (carp) sample analyses showed that PCB levels declined, but they remained above the FDA action level for PCBs in fish. The U.S. EPA performed a human health risk assessment for Waukegan Harbor in 2006. The analysis points to a PCB cleanup level of 0.2 ppm as being protective of human health. The U.S. EPA has not yet released a decision document to change the PCB cleanup level in the harbor sediment.

With respect to the Waukegan Coke Plant operable unit, the cleanup levels for the soil and groundwater contaminants are based on commercial/industrial future site-use assumptions. As detailed in the 2004 ESD, U.S. EPA agreed with the WCP site PRPs' recommendation to reduce the cleanup levels for arsenic and naphthalene in soil, although the future site-use assumption was kept at commercial/industrial in the Tech Memo analysis. All assumptions made in the 2004 ESD to support the WCP site cleanup level changes are still valid.

Table 4 (next page) presents the changes to OMC site cleanup levels to date.

Table 4: Changes in Chemical-Specific Standards

Contaminant	OU	Media	Standard		Citation/Year
Arsenic	WCP	Soil	1999: 940 ppm	2004: 639 ppm	ESD, 2004
Naphthalene			48,556 ppm	2,240 ppm	ESD, 2004
PCBs	Waukegan Harbor	Sediment	1984: 50 ppm	2006: 0.2 ppm	Not selected to date.

Changes in Exposure Pathways

The city of Waukegan rezoned the WCP site to high-density residential on October 7, 2002. Although this change would ordinarily impact exposure assumptions, as residential use implies an unlimited exposure and unlimited site-use assumption for the site, no changes in cleanup standards are needed. This is because the ESD set forth future residential use conditions at the site, including the future placement of ICs, placement of a 3-foot cover of clean soil over the site, and the use of engineered controls in constructing building foundations to prevent potential indoor air intrusion events. The city has agreed to follow these conditions if redevelopment occurs in accordance with its master plan.

Question C - Has any other information come to light that could call into question the protectiveness of the remedy?

Answer C – **No.** No other information has come to light to call into question the protectiveness of the completed remedial actions at the OMC site (except as detailed above in Answers A and B).

Technical Assessment Summary

Waukegan Harbor

The 50 ppm cleanup level for PCBs in harbor sediments is not protective based on PCB levels in fish remaining above the FDA action level and our updated risk assessment for the harbor that shows a protective PCB cleanup level would be about 0.2 ppm. Since harbor sediments average 2-3 ppm PCBs, the levels are currently more than ten times the protective cleanup level. The U.S. EPA, therefore, should evaluate potential cleanup methods for the harbor sediment to reduce PCB exposures to protective levels.

Waukegan Coke Plant

The city of Waukegan rezoned the WCP site to high-density residential from commercial/industrial in 2002. However, U.S. EPA issued an ESD in 2004, in which we

lowered the cleanup standards for two chemicals of concern at the site and also provided a basis for the city to redevelop the site in accordance with the new zoning designation.

PCB Containment Cells

According to data reviewed and the site inspection, the PCB containment cells are being operated and maintained properly. Thus, the remedy is functioning as intended by the 1984 Waukegan Harbor ROD and 1989 ROD Amendment.

OMC Plant 2

No remedial action has been completed at the OMC Plant 2 operable unit to date, although future cleanups are planned.

VIII. Issues

Table 5, below, presents the potential protectiveness issues U.S. EPA identified during the third Five-year Review for the OMC site.

Table 5: Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
Waukegan Harbor sediment PCB cleanup levels are not protective; fish are contaminated with PCBs.	Yes	Yes
Waukegan Coke Plant groundwater cleanup has not yet started; all ICs not in place.	No	Yes
PCB Containment Cells may require ICs to be in place for long-term protectiveness.	No	Yes
OMC Plant 2 – U.S EPA has identified risks to human health and the environment.	Yes	Yes

IX. Recommendations and Follow-up Actions

Table 6, below, presents U.S. EPA recommendations and follow-up actions for the issues identified in Table 5, above.

Table 6: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Waukegan Harbor: Sediment PCB levels are not protective. Fish are contaminated with PCBs.	Perform remedy selection process to determine protective cleanup level and then conduct selected cleanup action(s).	U.S. EPA, in consultation with Illinois EPA		ROD Amendment: Sept. 30, 2008	Yes	Yes
	Maintain fish-consumption advisory.	Illinois Dept of Public Health		Advisory was issued in February 2006	Yes	Yes
WCP: The Ground-water clean up has not yet begun; all ICs not in place.	Finish groundwater remedy construction and perform remedy; City and others to issue ICs, U.S. EPA to produce a IC Plan	PRPs for cleanup City, others for ICs	U.S. EPA, Illinois EPA U.S. EPA, Illinois EPA	Groundwater construction by July 2008; IC Plan – January 2010 (U.S. EPA)	No	Yes
PCB Containment Cells: May require ICs for long term protection.	Make final ICs determination as part of site-wide cleanup remedies selected. Produce IC Plan.	U.S. EPA		IC Plan – January 2010	No	Yes
U.S. EPA has identified risks at OMC Plant 2 site	Perform selected cleanup actions; consider ICs if necessary	U.S. EPA, in consultation with Illinois EPA		Funding dependent; estimated to be 2008-2010	No	Yes

X. Protectiveness Statement(s)

Waukegan Harbor

The U.S. EPA has determined that the Waukegan Harbor operable unit (OU #1) remedial action currently is not protective of human health and the environment because the 50 ppm PCB cleanup level selected in the 1984 ROD for the harbor sediment is too high, leading to high levels of PCBs in harbor-caught fish. The U.S. EPA shall undertake a remedy selection process that results in the issuance of a ROD Amendment in which U.S. EPA may designate a lower PCB cleanup level for the harbor sediments and select a protective cleanup remedy. In the interim, a fish-consumption advisory is in place for the northern Waukegan Harbor area. Long-term protectiveness could require compliance with other types of ICs (to be determined).

Waukegan Coke Plant

The U.S. EPA has determined that the remedy at the Waukegan Coke Plant operable unit (OU #2) is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Long-term protectiveness will require compliance with several types of ICs, as set forth in the 2004 Consent Decree.

PCB Containment Cells

The U.S. EPA has determined that the PCB Containment Cells operable unit (OU #3) currently is protective of human health and the environment, because the cleanup is complete and the remedy is operating as designed. Long-term protectiveness may require compliance with several types of ICs to prohibit interference with the containment cells (to be determined).

OMC Plant 2

The U.S. EPA has determined that the OMC Plant 2 operable unit (OU #4) currently is not protective of human health and the environment, because there are multiple contaminants in and around OMC Plant 2 that may cause actual or potential exposure to hazardous substances or pollutants. Over the short term the site fences may provide a barrier to casual site users (trespassers), but over the long term the abandoned buildings are an “attractive nuisance” and are subject to intrusion by scavengers. The site fences cannot check the movement of hazardous substances from the groundwater into Lake Michigan or Waukegan Harbor. No one is drinking or using the contaminated groundwater at this time, however.

The following actions should be taken to ensure protectiveness at the site: U.S. EPA, in consultation with Illinois EPA, should immediately begin (upon funding availability) the remedial actions selected in the September 2007 ROD. The U.S. EPA should also complete the pilot-scale groundwater testing as scheduled and conduct the remedy selection process for the groundwater as scheduled. The U.S. EPA should also continue to evaluate site conditions before remedial actions occur to determine if we should undertake necessary removal actions at OMC Plant 2 to reduce any immediate threats to human health and the environment. Lastly, if any of the selected remedies do not achieve UU/UE, then ICs should be considered to ensure that the remedies will function as intended. Long-term protectiveness may require compliance with several types of ICs.

XI. Next Review

The U.S. EPA will conduct the fourth Five-Year Review for the OMC site on or before September 26, 2012, which is five years after we issued the third Five-Year Review Report for the site.

Attachments

1. List of Documents Reviewed
2. Copies of Notice of OMC Five-Year Review advertisements
3. Comments received concerning the OMC Five-Year Review process

Attachment 1

List of Documents Reviewed

1. Second Five-Year Review Report for OMC site (September 2002)
2. Quarterly O&M Reports for the PCB Containment Cells (2004-2007)
3. Waukegan Coke Plant ROD (September 1999)
4. OMC Plant 2 Remedial Investigation and Feasibility Study Reports (Dec. 2006)
5. OMC Plant 2 ROD (September 2007)
6. Waukegan Coke Plant Remedial Design Documents (2005 and 2006)
7. Waukegan Harbor Remedial Alternatives Array and Data Gaps Report (2003)
8. Waukegan Harbor Risk Evaluation for Development of PCB Cleanup Level (2006)
9. Waukegan Harbor Preliminary Design Document (November 2005)
10. Waukegan Coke Plant ESD (September 2004)
11. Waukegan Coke Plant Remedial Action Oversight Reports (2004-2007)
12. Waukegan Coke Plant Remedial Action Report (Soils) (2006)
13. Waukegan Coke Plant Remedial Action Consent Decree (October 2004)
14. Press Release – Illinois Dept. of Public Health: Sports Fish Consumption Advisory (February 2006)
15. State Comment Letter – OMC Five-Year Review Report (September 2007)

Attachment 2

Newspaper Advertisements: Notice of OMC Five-Year Review



**La EPA Revisará el Sitio de
Superfund Outboard Marine Corporation
Waukegan, Illinois**

La Agencia para la Protección Ambiental de los Estados Unidos (EPA, por sus siglas en inglés) está llevando a cabo la tercera revisión quinquenal del sitio de Superfund Outboard Marine Corp. (OMC, por las siglas en inglés). La última revisión concluyó en septiembre del 2002. La ley de Superfund exige revisiones regulares de sitios donde la limpieza ha concluido pero donde aun hay manejo de residuos peligrosos en el sitio. Estas revisiones se hacen para garantizar que la limpieza continúa protegiendo la salud humana y el medio ambiente.

La revisión incluirá una evaluación de información de datos del fondo (*background*), requisitos de limpieza, efectividad de la limpieza y considera de forma anticipa acciones futuras. También mirará formas para la que la EPA opere de manera más eficiente.

La EPA seleccionó varias acciones de limpieza para el sitio OMC incluyendo la remoción de suelos y barro (sedimento) contaminados con PCBs tanto en la propiedad como en el Muelle Waukegan. Tres celdas de contención fueron construidas en el sitio para almacenar de manera permanente el suelo y barro contaminado. De igual forma se creó una nueva rampa para botes para reemplazar la que se utilizó como celda de contención. El monitoreo del sitio por parte de la EPA muestra que las celdas de contención han sido efectivas.

La EPA hará una descripción del progreso de cada uno de los remedios de limpieza en el informe de revisión quinquenal, el cual estará disponible el 26 de septiembre del 2007, en el repositorio que se describe abajo.

Documentos relacionados con el sitio están disponibles para revisión en:

Biblioteca Pública de Waukegan (Public Library)
128 North County St.

Cuando es posible, la información sobre el sitio también se encuentra en:
www.epa.gov/region5/sites

La EPA lo invita para que suministre información sobre la revisión quinquenal.
Por favor contactar a:

Kevin Adler
Gerente del Proyecto de Remediación de la EPA
(800) 621-8431 x 67078, días laborales de 9 a.m. a 4:30 p.m.
adler.kevin@epa.gov



**EPA to Review
Outboard Marine Corporation Superfund Site
Waukegan, Illinois**

U.S. Environmental Protection Agency is conducting its third five-year review of the Outboard Marine Corp. Superfund site. The last review was completed in September, 2002. The Superfund law requires regular reviews of sites where the cleanup is complete but hazardous waste remains managed on site. These reviews are done to ensure that the cleanup continues to protect human health and the environment.

The review will include an evaluation of background information, cleanup requirements, effectiveness of the cleanup and consider any anticipated future actions. It will also look at ways for EPA to operate more efficiently.

EPA selected several cleanup actions for the OMC site including removal of PCB-contaminated soil and mud (sediment) on both the property and in Waukegan Harbor. Three containment cells were built on the site to permanently store the contaminated soil and mud. Also, a new boat slip was created to replace the one used as a containment cell. EPA monitoring of the site shows that the containment cells have been effective.

EPA will describe the progress of each of the cleanup remedies in the five-year-review report, which will be available by September 26, 2007, at the repository listed below.

Site-related documents are available for review at:

Waukegan Public Library
128 North County St.

When possible, site information also is posted to:
www.epa.gov/region5/sites

EPA invites you to provide information for the five-year review. Please contact:

Kevin Adler
EPA Remedial Project Manager
(800) 621-8431 x 67078, weekdays 9 a.m. - 4:30 p.m.
adler.kevin@epa.gov

Attachment 3

State Comment Letter

September 19, 2007

Mr. Kevin Adler
Remedial Project Manager
United States Environmental Protection Agency
Region V – Mail Code SR-6J
77 W. Jackson Boulevard
Chicago, Illinois 60604

RE: Outboard Marine Corporation, Waukegan, Lake County, Illinois
Five Year Review Report

Dear Mr. Adler:

The Illinois Environmental Protection Agency ("Illinois EPA") has reviewed the Third Five Year Review Report dated September, 2007. Illinois EPA concurs with the findings of the report.

Specifically, the Illinois EPA agrees that:

The Waukegan Harbor operable unit (OU #1) remedial action is not protective of human health and the environment because the previous removal actions cleanup level of 50 ppm PCB was too high. A further cleanup remedy needs to be performed using a lower PCB cleanup level.

The remedial action for the Waukegan Manufactured Gas and Coke Plant operable unit (OU#2) is currently being implemented and efforts are being made to control exposure pathways that could result in unacceptable exposure risks. Therefore, the remedial action is not yet protective of human health and the environment but is expected to be upon completion.

However, Illinois EPA would like to add a comment restating its concerns regarding the proposed change from mixed use industrial to high density residential as this change applies to protectiveness. Illinois EPA is still concerned that future residents may be exposed to a level of risk due to the difference in length of time of exposure despite the proposed inclusion of a three-foot clean soil cover for all residential areas. This cover will virtually eliminate the ingestion pathway, but the inhalation pathway may still be relevant. An appropriately conducted evaluation for indoor and outdoor exposure should be conducted after the completion of U.S.EPA's remedy

The PCB Containment Cells operable unit (OU #3) appears to be protective of human health and the environment. The cells are complete and appear to be operating as designed.

The OMC Plant 2 operable unit (OU#4) remedial action is expected to be protective of human health and the environment upon completion, estimated to be in 2012. Currently, multiple contaminants in and around OMC Plant 2 potentially or actually cause exposures to pollutants or hazardous substances.

Thank you for your continued commitment to address the remediation goals of the OMC NPL Site and your coordination of work with Illinois EPA.

If you have any questions regarding this matter, please contact me at 217-785-8725.

Sincerely,

Erin J. Rednour, Remedial Project Manager
Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276